

Sub D4
Q3
18. (Amended) A solder joint comprising a Pb-free solder solidified about electrical conductors and consisting essentially of about 3.5 to about 7.7 weight % Ag, about 1.0 to about 4.0 weight % Cu and the balance essentially Sn wherein Sn is present in an amount of at least about 89 weight % Sn, said solder joint having a microstructure comprising beta Sn phase matrix and at least two intermetallic compounds, one intermetallic compound including Cu and Sn and another intermetallic compound including Ag and Sn, distributed uniformly in the beta Sn matrix phase.

Claim 19, line 3; delete "essentially".

Claim 20, line 10; replace "relative to" with ---not exceeding 15°C above---.

Sub D6
Q4
22. (Amended) In a soldering process involving solidifying a molten solder about electrical conductors, the improvement comprising solidifying a Pb-free solder consisting essentially of about 3.5 to about 7.7 weight % Ag, about 1.0 to about 4.0 weight % Cu and the balance essentially Sn wherein Sn is present in an amount of at least about 89 weight % Sn, said solidified solder having a microstructure comprising a beta Sn matrix and at least two intermetallic compounds dispersed in the matrix wherein one intermetallic compound includes Cu and Sn and another intermetallic compound includes Ag and Sn.

Claim 23, line 3; delete "essentially".

Please add new Claims 24-26 as follows:

Sub D7
Q5
24. A Pb-free solder consisting of about 3.6 to about 4.7 weight % Ag, about 0.9 to about 1.7 weight Cu, and the balance essentially Sn, said solder having a microstructure comprising a beta Sn matrix and at least two intermetallic compounds dispersed in the matrix wherein one intermetallic compound includes Cu and Sn and another intermetallic compound includes Ag and Sn.

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Sub D7 added

25. A solder joint comprising a Pb-free solder consisting of about 3.6 to about 4.7 weight % Ag, about 0.9 to about 1.7 weight Cu, and the balance essentially Sn, said solidified solder having a microstructure comprising a beta Sn matrix and at least two intermetallic compounds dispersed in the matrix wherein one intermetallic compound includes Cu and Sn and another intermetallic compound includes Ag and Sn.

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26. In a soldering process involving solidifying a molten solder, the improvement comprising solidifying a Pb-free solder consisting of about 3.6 to about 4.7 weight % Ag, about 0.9 to about 1.7 weight % Cu and the balance essentially Sn, said solidified solder having a microstructure comprising a beta Sn matrix and at least two intermetallic compounds dispersed in the matrix wherein one intermetallic compound includes Cu and Sn and another intermetallic compound includes Ag and Sn.

REMARKS

Applicants have amended page 1 of the specification to reflect the contractual origin of this invention as required by the contract with the U.S. Government.

Claims 2-5, 10, and 17 are rejected under 35 USC 112, second paragraph as indefinite. With respect to Claims 2-4, Applicants disagree with this rejection in that Claim 1 employs well accepted "consisting essentially of" terminology that permits inclusion of unspecified alloying elements that do not substantially alter the characteristics of the alloy. Reconsideration of the rejection of Claims 2-4 is requested.

Claims 1, 4, 6, 7, 12, 13, 16, 18, and 20-22 are rejected under 35 USC 102(b) in view of the Ferrie're et al. reference (U.S. Patent No. 1 437 641).

Claim 1 has been amended in a manner to distinguish over the Ferrie're et al. reference. In particular, Claim 1 recites a Pb-free electrical conductor solder consisting essentially of about 3.5 to about 7.7 weight % Ag, about 1.0 to about 4.0 weight % Cu